

REMARKS

As a preliminary matter, Applicants appreciate the courtesy extended by the Examiner during the October 16, 2003 telephone conference with Applicants' undersigned attorney.

Claims 1, 3, and 11 stand rejected under 35 U.S.C. 103(a) as being obvious over Suzuki et al. (U.S. Patent No. 6,256,082), in view of Yoo et al. (U.S. Publication No. U.S. 2002/0008827). In response, Applicants amended claim 1 and respectfully traverse because the cited references do not disclose or suggest a liquid crystal display device that includes, among other things, a pair of substrates carrying respective electrodes thereon that face each other across the liquid crystal layer that is sealed between the substrates in combination with an insulating layer that varies electric field orientations in a pixel region when a voltage is applied between the substrates.

In the Office Action of August 26, 2002, on pg. 3, the Examiner states that the Suzuki et al. reference discloses an insulating layer that varies electric field orientations in a pixel orientation when a voltage is applied between a pair of substrates. Applicants respectfully disagree with this statement. The Suzuki et al. reference discloses that the insulating layer 26 completely and continuously covers the electrode 25. This is necessary in order to prevent a short circuit between the electrodes 22 and 25, which would prevent the desired oblique electric field from being formed. Since the insulating layer 26 of the Suzuki et al. reference covers the surface of the glass substrate continuously, the structure cannot achieve a desired variation or distortion of the electric field. In addition, even though the

thickness of the insulating layer 26 is smaller relative to the part where the insulating layer 26 covers the electrode 25, this does not cause any modulation effect on the electric field. Rather, the Suzuki et al. reference is silent about the feature of distorting or modulating an electric field by using an insulating pattern.

The Yoo et al. reference discloses a multiple-domain LCD panel of an in-plane switching mode as zigzag dielectric patterns formed in a liquid crystal layer for controlling an azimuth angle of the liquid crystal molecules. An electric field for orientating the liquid crystal molecules is formed between a pair of such zigzag electrodes, which are provided on the same substrate. In particular, the Yoo et al. reference discloses that the electric field to be applied to the liquid crystal is generated in a plane parallel to a substrate (see paragraph 0003). Accordingly, Yoo et al. does not disclose or suggest a liquid crystal display device that includes an insulating layer that varies electric field orientations in a pixel region when a voltage is applied between a pair of substrates. In addition, Yoo et al. does not disclose or suggest a LCD panel in which a pair of substrates carry respective electrodes thereon that face each other across the liquid crystal layer with the liquid crystal layer being sealed between the substrates. Rather, the Yoo et al. reference as illustrated in FIG. 13, for example, has an in-plane structure wherein a common electrode 62 and a pixel electrode 76 that do not have liquid crystal molecules 80 sealed therebetween.

In contrast, the present invention varies electric field orientations in a pixel region when a voltage is applied between a pair of substrates by using an edge-effect. As illustrated in FIG. 9A, there is no distortion of the electric field in the event that the

insulating member 46 is formed to cover the ITO electrode 42, and hence the substrate, continuously. As amended, claim 1 features a pair of substrates carrying respective electrodes thereon that face each other across the liquid crystal layer, and have a liquid crystal layer sealed therebetween. This structure is different than the in-plane structure of the Yoo et al. reference. As a result, there is no motivation for one skilled in the art to combine the teaching of the Suzuki et al. reference, which discloses the use of upper and lower electrodes for driving the liquid crystal molecules in the liquid crystal layer sandwiched by the upper and lower electrodes with the Yoo et al. reference, which discloses an in-plane switching mode LCD panel.

With respect to claim 3, the text "plurality of insulating patterns are connected with each other by an insulating film" is disclosed on page 21, line 15 of Applicants' specification. Namely, the insulating films 46 have thick portions 46A (insulating patterns) and a thin portion 46B (insulating film) that are formed on the ITO electrode 42. For these reasons, withdrawal of the rejection of claims 1, 3, and 11 is respectfully requested.

The Examiner states on page 4 of the Office Action (Paper No. 11), that the rest of the rejections as stated in the original Office Action (Paper No. 6) are still valid. Namely, claims 1-6, 10-11 and 25-26 stand rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki et al.; claims 7 and 8 stand rejected under 35 U.S.C. 103(a) as being obvious over Suzuki et al. in view of Koma et al. (U.S. Patent No. 6,362,864); claims 13-24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. in view of Hisatake et al. (U.S. Patent No. 5, 434,690); and claims 9 and 12 stand rejected under 35

U.S.C. 103(a) as being obvious over Suzuki et al. in view of Kondo et al. (U.S. Patent No. 6,341,004). Applicants traverse these rejections.

Claim 1-6, 10-11, and 25-26 stand rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki et al. With respect to the §102(e) rejection, the arguments asserted above to overcome the rejection of claims 1, 3, and 11 are reasserted herein. In addition, claims 2 and 17 were previously cancelled in Amendment A, and their features were incorporated into the subject matter of claim 1. As indicated by the Examiner, the Suzuki et al. reference fails to disclose or suggest a liquid crystal display device that has, among other things, an insulating layer comprising a plurality of insulating patterns that control an in-plane direction of liquid crystal molecules in a liquid crystal layer when a voltage is applied across the electrodes. Since the Examiner has not rebutted these arguments, or responded to the fact that claim 1 has been amended to incorporate the subject matter of dependent claim 17, which was acknowledged by the Examiner in the Office Action (Paper No. 6) as not being anticipated by the Suzuki et al. reference, withdrawal of the §102(e) rejection of claims 1, 3-6, 10-11 and 25-26 is respectfully requested.

With respect to the remaining §103 rejections under the Suzuki et al., Koma et al., Hisatake et al., and Kondo et al. references, Applicants respectfully traverse these rejections because claims 7-9, 12-16, and 18-24 depend upon claim 1, so they necessarily include all the features of independent claim 1, plus additional features. Thus, Applicants submit that the §103 rejections of these claims have been overcome for the same reasons mentioned above to overcome the §102(e) and 103(a) rejections of independent claim 1.

Accordingly, Applicants respectfully request that the §103 rejections to claims 7-9, 12-16, and 18-24 also be withdrawn.

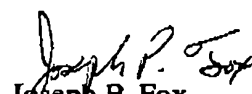
Previously added claim 27 further defines the substrates as being transparent. Since claim 27 depends upon amended claim 1, Applicants believe that claim 27 is allowable for the reasons recited above, and allowance of previously added claim 27 is respectfully requested.

For all of the foregoing reasons, Applicants submit that this Application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite the prosecution.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By


Joseph P. Fox
Registration No. 41,760

November 10, 2003

300 South Wacker Drive - Suite 2500

Chicago, Illinois 60606

Telephone: (312) 360-0080

Facsimile: (312) 360-9315

Customer Number 24978

K:\09-11\656\05\SuppAmend\Amend D.doc